

**DECLARATION**

As a below named inventor, I declare that:

My residence, post office address and citizenship are as stated below next to my name; I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **SYSTEM FOR BANDWIDTH ALLOCATION IN A COMPUTER NETWORK** the specification of which \_\_\_\_ is attached hereto or X was filed on August 27, 1999 as Application No. 09/384,865 and was amended on \_\_\_\_\_ (if applicable).

I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56. I claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

**Prior Foreign Application(s)**

Country	Application No.	Date of Filing	Priority Claimed Under 35 USC 119
	—		

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

Application No.	Filing Date
60/137,160	June 1, 1999
60/137,153	June 1, 1999

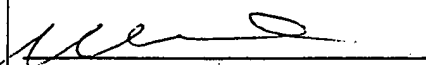

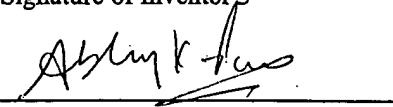
I claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application No.	Date of Filing	Status

Full Name of Inventor 1:	Last Name: WELCH	First Name: WILLIAM	Middle Name or Initial:
Residence & Citizenship:	City: San Francisco	State/Foreign Country: California	Country of Citizenship: United States of America
Post Office Address:	Post Office Address: 650 Second Street #203	City: San Francisco	State/Country: California Postal Code: 94107
Full Name of Inventor 2:	Last Name: MCCANNE	First Name: STEVEN	Middle Name or Initial:
Residence & Citizenship:	City: Berkeley	State/Foreign Country: California	Country of Citizenship: United States of America
Post Office Address:	Post Office Address: 1571 San Lorenzo Ave.	City: Berkeley	State/Country: California Postal Code: 94707

Full Name of Inventor 3:	Last Name: PAREKH	First Name: ABHAY	Middle Name or Initial: K.	
Residence & Citizenship:	City: San Francisco	State/Foreign Country: California	Country of Citizenship: United States of America	
Post Office Address:	Post Office Address: 2300 Buchanan Street, Apt. #8	City: San Francisco	State/Country: California	Postal Code: 94115

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature of Inventor 1 	Signature of Inventor 2 	Signature of Inventor 3 
William Welch	Steven McCanne	Abhay K. Parekh
Date 11-11-99	Date 1/24/99	Date 11/4/99



19599-00021065  
UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
ASSISTANT SECRETARY AND COMMISSIONER  
OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
DDT

FEBRUARY 22, 2000

PTAS  
TOWNSEND AND TOWNSEND AND CREW LLP  
DANIEL D. TAGLIAFERRI  
TWO EMBARCADERO CENTER, 8TH FLOOR  
SAN FRANCISCO, CALIFORNIA 94111-3834



\*101207671A\*

UNITED STATES PATENT AND TRADEMARK OFFICE  
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 703-308-9723. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, ASSIGNMENT DIVISION, BOX ASSIGNMENTS, CG-4, 1213 JEFFERSON DAVIS HWY, SUITE 320, WASHINGTON, D.C. 20231.

RECORDATION DATE: 11/15/1999

REEL/FRAME: 010390/0944  
NUMBER OF PAGES: 6

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:  
WELCH, WILLIAM

DOC DATE: 11/11/1999

ASSIGNOR:  
MCCANNE, STEVEN

DOC DATE: 11/11/1999

ASSIGNOR:  
PAREKH, ABHAY K.

DOC DATE: 11/11/1999

ASSIGNEE:  
FAST FORWARD NETWORKS  
75 HAWTHORNE STREET, SUITE 601  
SAN FRANCISCO, CALIFORNIA 94105

SERIAL NUMBER: 09384865  
PATENT NUMBER:

FILING DATE: 08/27/1999  
ISSUE DATE:

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TOWNSEND & CREW

010390/0944 PAGE 2

JOANN STEWART, EXAMINER  
ASSIGNMENT DIVISION  
OFFICE OF PUBLIC RECORDS

11-24-1999



Attorney Docket No. 19599-2-1US

FORM PTO-1595  
(Rev. 6-93)

101207671

U.S. Department of Commerce  
Patent and Trademark Office

To the Honorable Asst. Commissioner for Patents. Please record the attached original documents or copy thereof

1. Name of conveying party(ies):

William Welch

Additional name(s) of conveying parties attached? ☒ Yes  
☐ No.

2. Name and address of receiving party(ies)

Name: FastForward Networks

Internal Address:

Street Address: 75 Hawthorne Street, Suite 601

City: San Francisco State: CA ZIP: 94105

Additional names and addresses attached? ☐ Yes ☒ No

3. Nature of conveyance:

☒ Assignment ☐ Merger☐ Security Agreement ☐ Change of Name☐ Other:

Execution Date: November 11, 1999

4. Application Number(s) or Patent Numbers.

If this document is being filed together with a new application, the execution date of the application is:

A. Patent Application No(s): 09/384,865

B. Patent No(s):

Additional numbers attached? ☐ Yes ☒ No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Daniel D. Tagliaferri  
TOWNSEND AND TOWNSEND AND CREW LLP  
Two Embarcadero Center, 8<sup>th</sup> Floor  
San Francisco, California 94111-3834  
(415) 576-0200

6. Total number of applications and patents involved 1

7. Total fee (37 CFR 3.41): -----\$40.00

☐ Enclosed ☒ Charge Fees to Deposit Account☒ Charge any additional fees associated with this paper or during the pendency of this application, or credit any overpayment, to deposit account.

8. Deposit account number: 20-1430

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9. Statement and signature.

*To the best of my knowledge and belief, the foregoing is true and correct and any attached copy is a true of copy of the original document.*Daniel D. Tagliaferri  
Name of Person Signing

Signature

Date

Atty Reg. No. 43,178

Total number of pages including cover sheet, attachments and document 5

10. Change Correspondence Address to that of Part 5? ☒ Yes ☐ No

OMB No. 0651-0011 (exp. 4/94)

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Mail documents to be recorded with required cover to:

11/22/1999 DWGUYEN 00000281 201430 09384865

Asst. Commissioner for Patents  
Box: Assignments  
Washington, D.C. 20231

01 FC:581 / 40.00 CH /

ASSIGNMENT OF PATENT APPLICATION

JOINT

WHEREAS, William Welch, of 650 Second Street #203, San Francisco, California 94107, Steven McCanne, of 1571 San Lorenzo Ave., Berkeley, California 94707, Abhay K. Parekh, of 2300 Buchanan Street, Apt. #8, San Francisco, California 94115, hereinafter referred to as "Assignors," are the inventors of the invention described and set forth in the below-identified application for United States Letters Patent:

Title of Invention: SYSTEM FOR BANDWIDTH  
ALLOCATION IN A COMPUTER  
NETWORK

Date(s) of execution of Declaration: \_\_\_\_\_

Filing Date: August 27, 1999

Application No.: 09/384,865; and

WHEREAS, FastForward Networks, located at 75 Hawthorne Street, Suite 601, San Francisco, California, 94105, hereinafter referred to as "ASSIGNEE," is desirous of acquiring an interest in the invention and application and in any U.S. Letters Patent and Registrations which may be granted on the same;

For good and valuable consideration, receipt of which is hereby acknowledged by Assignors, Assignors have assigned, and by these presents do assign to Assignee all right, title and interest in and to the invention and application and to all foreign counterparts (including patent, utility model and industrial designs), and in and to any Letters Patent and Registrations which may hereafter be granted on the same in the United States and all countries throughout the world, and to claim the priority from the application as provided by the Paris Convention. The right, title and interest is to be held and enjoyed by Assignee and Assignee's successors and assigns as fully and exclusively as it would have been held and enjoyed by Assignors had this Assignment not been made, for the full term of any Letters Patent and Registrations which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

Assignors further agree that they will, without charge to Assignee, but at Assignee's expense, (a) cooperate with Assignee in the prosecution of U.S. Patent applications and foreign counterparts on the invention and any improvements, (b) execute, verify, acknowledge and deliver all such further papers, including patent applications and instruments of transfer, and (c) perform such other acts as Assignee lawfully may request to obtain or maintain Letters Patent and Registrations for the invention and improvements in any and all countries, and to vest title thereto in Assignee, or Assignee's successors and assigns.

IN TESTIMONY WHEREOF, Assignors have signed their names on the dates indicated.

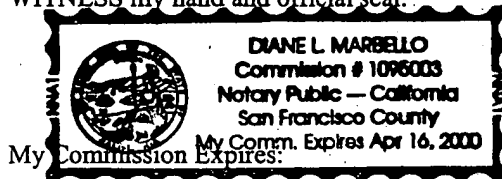
Dated: November 11, 1999

  
William Welch

STATE OF CALIFORNIA     )  
                                      )  
COUNTY OF                    )     ss.

On November 11, 1999, before me, Diane L. Marbello, personally appeared William Welch, ~~personally known to me~~ (or proved to me on the basis of satisfactory evidence) to be the person(x) whose name(x) is subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(x) on the instrument the person(x), or the entity upon behalf of which the person(x) acted, executed the instrument.

WITNESS my hand and official seal.



Diane L. Marbello  
NOTARY PUBLIC

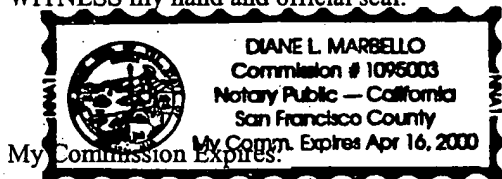
Dated: November 11, 1999

  
Steven McCanne

STATE OF CALIFORNIA     )  
                                      )  
COUNTY OF                    )     ss.

On November 11, 1999, before me, Diane L. Marbello, personally appeared Steven McCanne, ~~personally known to me~~ (or proved to me on the basis of satisfactory evidence) to be the person(x) whose name(x) is subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(x) on the instrument the person(x), or the entity upon behalf of which the person(x) acted, executed the instrument.

WITNESS my hand and official seal.



Diane L. Marbello  
NOTARY PUBLIC

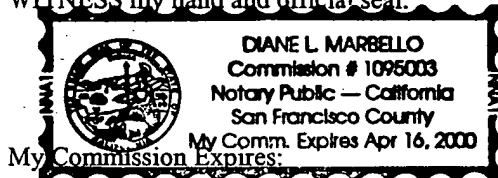
Dated: November 11, 1999

Abhay K. Parekh  
Abhay K. Parekh

STATE OF CALIFORNIA )  
 )  
COUNTY OF ) SS.

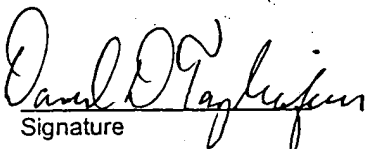
On November 11, 1999, before me, Diane L. Marbello, personally appeared Abhay K. Parekh, ~~personally known to me~~ (or proved to me on the basis of satisfactory evidence) to be the person(x) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/s/he/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.



Diane L. Marbello  
NOTARY PUBLIC



<b>FORM PTO-1595</b> (Rev. 6-93)		<b>Recordation Form Cover Sheet</b> (Patents Only)		<b>U.S. Department of Commerce</b> <b>Patent and Trademark Office</b>	
To the Honorable Asst. Commissioner for Patents. Please record the attached original documents or copy thereof					
<b>1. Name of conveying party(ies):</b>  William Welch  Additional name(s) of conveying parties attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No.			<b>2. Name and address of receiving party(ies)</b>  Name: FastForward Networks  Internal Address:  Street Address: 75 Hawthorne Street, Suite 601  City: San Francisco      State: CA    ZIP: 94105  Additional names and addresses attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<b>3. Nature of conveyance:</b>  <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Merger  <input type="checkbox"/> Security Agreement <input type="checkbox"/> Change of Name  <input type="checkbox"/> Other:  Execution Date: November 11, 1999			<b>4. Application Number(s) or Patent Numbers.</b>  If this document is being filed together with a new application, the execution date of the application is:  <div style="display: flex; justify-content: space-between;"> <span>A.      Patent Application No(s): 09/384,865</span> <span>B.      Patent No(s):</span> </div> <div style="text-align: center; margin-top: 5px;">             Additional numbers attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No           </div>		
<b>5. Name and address of party to whom correspondence concerning document should be mailed:</b>  Name: Daniel D. Tagliaferri TOWNSEND AND TOWNSEND AND CREW LLP Two Embarcadero Center, 8 <sup>th</sup> Floor. San Francisco, California 94111-3834 (415) 576-0200			<b>6. Total number of applications and patents involved</b> 1  <b>7. Total fee (37 CFR 3.41):</b> _____ \$40.00  <input type="checkbox"/> Enclosed <input checked="" type="checkbox"/> Charge Fees to Deposit Account  <input checked="" type="checkbox"/> Charge any additional fees associated with this paper or during the pendency of this application, or credit any overpayment, to deposit account.  <b>8. Deposit account number:</b> 20-1430		
<b>DO NOT USE THIS SPACE</b>					
<b>9. Statement and signature.</b>  <p style="margin-left: 40px;"><i>To the best of my knowledge and belief, the foregoing is true and correct and any attached copy is a true of copy of the original document.</i></p> <div style="display: flex; justify-content: space-between; align-items: flex-end; margin-top: 20px;"> <div style="width: 30%;"> <p><u>Daniel D. Tagliaferri</u> Name of Person Signing</p> <p>Atty Reg. No. 43,178</p> </div> <div style="width: 30%; text-align: center;">               Signature           </div> <div style="width: 20%; text-align: center;"> <p><u>11/12/99</u> Date</p> </div> <div style="width: 20%; text-align: right;"> <p>Total number of pages including cover sheet, attachments and document    5</p> </div> </div>					
<b>10. Change Correspondence Address to that of Part 5?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
<b>OMB No. 0651-0011 (exp. 4/94)</b>					
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1. Additional name(s) of conveying party(ies):  
(Continued from Page 1)

Steven McCanne  
Abhay K. Parekh

2. Additional name(s) and address(es) of receiving party(ies):  
(Continued from Page 1)

3. Additional application number(s) or patent number(s):  
(Continued from Page 1)

A. Patent Application No.(s)

B. Patent No.(s)

SF 1043380 v1